EPA Region 7 TMDL Review

TMDL ID	366	*Water Body ID*	17, 18
Water Body Name	South Cottonwood River		
Pollutant	Mercury		
Tributary	Antelope Creek 19; Stony Brook 25; Unnamed Stream 456		
State	KS	*HUC*	11070202
Basin	Neosho		
Submittal Date	01/13/2005		
Approved	yes		

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

Letter received by EPA January 13, 2005, formally submitting this TMDL for approval under Section 303(d).

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

The loading capacity is defined by the numeric water quality criterion for mercury. The endpoint is for total mercury concentrations to remain below the chronic criteria at all flows. Protection to chronic conditions will provide for protection at acute levels as well. The TMDL was developed using the chronic WQS criteria at various flow conditions; historic and target TMDL values are displayed graphically in load duration curves covering the range of flows for mercury. The TMDL curve is based on water quality standards (WQS) attainment and achievement of the expected aquatic life use.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

The TMDL describes all applicable WQS and the beneficial uses; the impaired use is the expected aquatic life use. The target is the water quality criteria for chronic toxicity for mercury.

Link Between Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

The target is the water quality criteria for chronic toxicity; the link between the target and the criterion is direct. The load duration curve was used to calculate the TMDL in general; a wide range of "flow exceedance" data represents a complete range of flows anticipated in the South Cottonwood River. Measured mercury concentrations and the chronic criterion load were used to calculate the observed load and the assimilative capacity based on the chronic criterion, respectively. In calculating the TMDL the average condition was considered across the seasons to establish goals of the endpoint and desired reductions. Therefore, the target level was multiplied by the average daily flow for the South Cottonwood River across all hydrologic conditions which is represented graphically by the integrated area under the load duration curves.

The Generalized Watershed Loading Function (GWLF) model was used to calculate the watershed yield for sediment, and mercury concentrations in soils were derived from several USGS studies in Kansas. The source assessment determined mercury was a non-point source pollutant load in the watershed, therefore, the anticipated average load allocation (LA) reduction was calculated by subtracting the LA from the GWLF non-point loading estimate.

Since atmospheric deposition is a contributing source of the mercury in the South Cottonwood River, the Regional Modeling System for Aerosols and Deposition (REMSAD) model was used to derive both wet and dry mercury deposition rates. The REMSAD model outputs for wet and/or dry deposition were converted to GIS files, allowing the correlation of the model results with information stored in GIS systems. These GIS files were intersected with coverages of the South Cottonwood River watershed to provide spatially weighted averages of both wet and dry mercury deposition in the watershed.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

Land use and sources in the watershed are described. The majority of the non-point source loading of mercury is likely emanating from a derelict battery site and atmospheric deposition; there is one small NPDES permitted wastewater treatment plant point source in the watershed. Based on the REMSAD modeling, it appears that non-point source loading of mercury from both wet and dry deposition represent over 99% of the total loading to the watershed. All significant sources are discussed.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

The allocation of wasteloads (WLAs) and load allocations (LAs) are made in terms of targeted loads. The TMDL curve displays the targets over the range of flow. A very minor contribution is made to the total load from the single point source. The load capacity is defined as 0.000596 pounds/day of mercury.

WLA Comment

The WLA is 0.0000038 pounds/day of mercury. The load is based on end of pipe criteria.

LA Comment

The average LA is 0.00053 pounds/day of mercury, and 98.3% reduction.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

The margin of safety is explicitly set at 10 percent of the load capacity, an average of 0.000059 pounds/day of mercury.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

Seasonal variation and critical conditions are considered in the use of the load duration curve methodology which accounts for loads at all flow conditions.

Public Participation

Submital describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

Public meetings to discuss TMDLs in the Neosho Basin were held January 9, 2002, in Burlington, March 4, 2002, in Council Grove, and July 30, 2004, in Marion. Public hearings were held in Burlington and Parsons on June 3, 2002. The Neosho Basin Advisory Committee met to discuss the TMDLs in the basin on October 2, 2001, January 9, March 4,

and June 3, 2002. The TMDL was public noticed on the KDHE TMDL website: http://www.kdhe.state.ks.us/TMDL.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

KDHE will continue to collect bimonthly samples at rotational Station 635 in 2004 and 2008 including total mercury samples samples. More intensive sampling may be conducted if monitoring indicates continued impaired status. Use of the real time flow data available at the South Cottonwood River stream gaging station, or other appropriate station, can help direct sampling efforts. Also, use of USEPA Method 1669 - Sampling Ambient Water for Trace Metals at USEPA Water Quality Criteria Levels for ultra-clean mercury sampling and analysis could help to further define potentially bioavailable and toxic forms of mercury in the subwatershed.

Reasonable assurance

Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.

Reasonable assurance, although not necessary for this TMDL since the point source contribution is inconsequential, includes numerous authorities and funding through the Kansas Water Plan.